Special Article

Crop Production Capacity in Europe

From Spain to Ukraine, agricultural production is pursued under a vast array of agronomic and political conditions. In Western Europe, policies in recent decades have maintained high farm prices and provided income payments to farmers, leading to surplus production. High food prices in Western Europe, maintained through high import barriers, dampened domestic demand, although high incomes allowed adequate diets. The region has been a large grain exporter for over two decades but mainly through subsidies. Agricultural policies have ensured a higher return to farmers than would prevail under market conditions, and Eastern European countries planning on joining the European Union (EU) could be in the same position in a few years.

In the former Soviet Union (FSU) and in Eastern Europe, where countries had been under Soviet influence, expanding area and yields prior to the 1990's led to greater production. Food subsidies encouraged high consumption in Eastern Europe and in the former Soviet Union, which prevented the regions from being major exporters.

Europe as a whole will continue to be a net exporter of grain in the next decade, although the magnitude of exports will depend on the ability of the FSU, particularly Russia and Ukraine, to implement reforms that would increase production capacity.

Europe in the Aggregate

Area harvested has generally declined across all three regions of Europe. Western Europe cropland use dropped by 10 percent from 1961 to 2000 because of urban growth and land set-aside measures. Eastern European crop area fell by 17 percent during the same period, due mostly to movement out of marginal land during the reforms of the early 1990's when crop subsidies were discontinued. In the FSU, large amounts of land were taken out of production during the last decade (about 15 million hectares or a drop of nearly 19 percent) because of low prices for crops and the removal of input subsidies.

Despite a declining area, Western European grain production has been climbing steadily throughout the last 40 years, from 92 million to 217 million metric tons in 2000, as yields increased from 2.14 to 5.63 tons per hectare. U.S. yields moved from 2.51 to 5.93 tons per hectare for the same time period. (Data are from the Food and Agriculture Organization.) The yield increase has been largely a combination of the application of technology and the high prices and income support provided by the Common Agricultural Policy (CAP) of the European Union.

Eastern European production nearly doubled from 1961 to 1989 because of rising yields. But production has fallen considerably in the last decade as yields declined. The recent fall in yields in Eastern Europe—from 3.74 tons per hectare in 1991 to 2.8 tons per hectare in 2000—resulted from policy changes that accompanied political turmoil in the early 1990's. These policy changes were comprised largely of the withdrawal of subsidies both for inputs such as fertilizer, pesticides, and subsidized loans to farms.

ACDI/VOCA

In the FSU, average yields fell from 1.96 tons per hectare in 1992 to 1.58 tons per hectare in 2000, for similar reasons. With less area in grain and with falling yields, production in the FSU dropped 35 percent from 1992 to 2000.

The critical issue for crop production in Europe is whether grain yields in Eastern Europe and in the FSU will return to previous levels and eventually begin to approach yields in Western Europe.

Agricultural Gains Reflect Policy in Western Europe

Before World War II, most countries in Western Europe were net grain importers, and during WWII and immediately thereafter the populations of many of these countries suffered malnutrition. In an attempt to prevent future wars, to advance their economies, and to guard against future food crises, six countries formed the European Economic Community in 1957 (predecessor to the European Union) and in 1967 implemented the Common Agricultural Policy (CAP), which has been the principal engine of agricultural growth in Western Europe ever since. The CAP now applies to 15 countries (the current EU members) and will likely expand to over 20 EU members in the next few years with additions from Eastern Europe and the Baltics. The agricultural policy goals of the original member countries (Belgium, Luxembourg, France, Italy, the Netherlands, and West Germany) were, among other things, to equalize farm and nonfarm income, provide abundant food at reasonable prices, and increase food

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self-sufficiency. Policies used to accomplish these goals included guaranteed farm prices set at relatively high levels, prohibitively high tariffs, and export subsidies as an outlet for any possible excess production (and conversely, export taxes when world prices rise above EU prices.)

The policy goals have generally been accomplished—the EU has one of the highest grain yields in the world, with a large grain surplus exported. Self-sufficiency in total grains increased from 86 percent in 1968/69 to 118 percent in 1990/91. Per capita farm income in the EU has also stayed relatively close to nonfarm per capita income because of the CAP. However, the EU also has the world's largest agricultural budget.

The success of the CAP (albeit at high cost to consumers and taxpayers) and of the EU is evidenced by successive enlargements: 1973 (Denmark, United Kingdom, and Ireland), 1981 (Greece), 1986 (Spain and Portugal), and 1995 (Austria, Finland, and Sweden.) Numerous other European countries have applied for membership and are likely to become members soon, including countries in Eastern Europe (Hungary, the Czech Republic, Poland, and Slovenia). These countries have already begun to align their policies with the CAP. Countries in the Baltic region have also applied for EU membership and will likely join in the next decade—Estonia is already in final negotiations with the EU over details of membership, and Latvia and Lithuania are likely to follow soon.

Agricultural production has exceeded expectations of the original founders of the CAP and led to large surpluses of grain, butter, wine, and beef. Successive reforms of the CAP in 1992 and 1998 that led to lower policy prices have not slowed the growth in production, as yields and total production continue to rise despite less intensive fertilizer use and declines in area harvested. Large stocks of grains and their associated costs continue to plague EU agricultural policy.

Other countries in Western Europe, such as Switzerland and Norway, have agricultural policy regimes similar to the CAP, and their standards and legislation are equivalent to the EU's legislation for trading purposes. Thus, yields are high throughout Western Europe as technology continues to push up yields, increasing total production in spite of a small decline in area harvested. With consumption levels relatively stable and yields increasing, pressure on the European Union budget due to the CAP will mount as storage costs and/or export subsidies climb. However, trade agreement constraints on export quantities under the World Trade Organization limit subsidized exports.

Western European countries have rapidly adopted new technology since the end of WWII and have reaped the benefits of early adoption. Farmers in the EU have been able to increase yields in the face of lower prices and less fertilizer use. Improved seeds, cultivation techniques, and pest control methods (not higher pesticide usage) have been largely responsible for higher yields, although other factors such as added irrigation capacity and better machinery have also helped. Continued research and development in these areas will likely push yields further upward in spite of lower policy prices.

Western Europe—the European Union-15 (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom) plus Switzerland and Norway.

Eastern Europe—Albania, Boznia-Herzogovina, Bulgaria, Croatia, *Czech Republic*, *Hungary*, Macedonia, *Poland*, Romania, *Slovakia*, *Slovenia*, and Yugoslavia.

Former Soviet Union (FSU)—Russian Federation, Ukraine, Belarus, Uzbekistan, Kazakstan, Georgia, Azerbaijan, Moldova, Kyrgyzstan, Tajikistan, Armenia, Turkmenistan, and the Baltics.

Baltics—*Estonia, Latvia, and Lithuania*.

Italics indicate countries most likely to become EU members in the next decade.

Nitrogen pollution is a particular concern, and EU legislation setting limits on groundwater levels of nitrate contamination has been in effect for a few years, although the legislation affects mostly livestock operations rather than crop producers. Western Europe is densely populated, and pollution from the agricultural sector will continue to affect crop production indirectly through impacts on livestock production.

Transition Underway in Eastern Europe . . .

Developments in agriculture in Eastern Europe differ dramatically from the West. Withdrawal of consumer and producer subsidies led to a rather chaotic economic situation in most countries when they gained political independence in the early 1990's, resulting in lower crop yields and lower food consumption. Yields fell because inputs such as fertilizer and machinery became too expensive relative to farm income, leading to a sharp decline in their use. Even water use for irrigation was adversely affected by withdrawal of subsidies. Similar developments occurred in the FSU, except that large areas of poor land in the FSU were idled, in contrast with Eastern Europe where producers were not farming as much marginal land.

Input subsidies were largely eliminated in Eastern Europe after the collapse of communism in the early 1990's, and fertilizer and pesticide prices rose rapidly. While this led to lower input use, residual fertilizer in the soil prevented yields from dropping initially. In general, farmers had been applying too much fertilizer, but yields declined when nutrient reserves were eventually exhausted.

Technological innovations were implemented less efficiently in the East than in the West, leading to lower yields for the same amount of inputs. Plant breeding research was fairly advanced, but applications of the information and methods in the field were hindered by lack of an effective extension service. Also, farmers could not obtain the credit required to make innovations. Tractor usage also declined as fuel prices rose rapidly, reflecting world market conditions and internal marketing problems. Uncertainty about land ownership was also a deterrent to investing in agriculture and hastened the decline in production in the 1990's.

Settling land ownership issues will be necessary to attract investment in agriculture and return production in the region to its previous level.

Eastern European countries that are in line to join the EU within the next few years are likely to see their agriculture rebound if farmers are granted compensation payments that EU farmers receive for cuts in support prices (*AO* January-February 2001). Such payments were begun in 1993 under the 1992 CAP reform. The compensation payments increased with the cuts in policy prices of the 1998 CAP reform under Agenda 2000, which ostensibly prepares the EU for enlargement to the East.

The effect on yields of joining the EU will be key to future crop production levels in Eastern European countries. With membership, adoption of technology is likely to be rapid because of access to Western European output and input markets and an increase in foreign direct investment. Higher support prices, in combination with direct payments, will allow farmers in the East to update capital equipment. Enhanced productivity and more efficient marketing channels will benefit producers after enlargement. Yields should rapidly approach pre-1990 levels and eventually approach Western European levels.

It appears that 8 of 15 countries in Eastern Europe and the Baltics may become EU members within the next decade. Although the Baltics are included in the FSU, their agricultural sectors are more similar to those in Eastern Europe. Farmers in these countries may also receive higher prices (dependent on currency rates and CAP reforms) for their crops than they currently receive, and this should increase yields. Countries that will take longer to become EU members will most likely adopt EU policies over time, increasing their yields and total crop production. The countries in Eastern Europe joining the EU will most likely be net exporters of grain within the next decade.

. . . & in Russia & Neighboring Countries

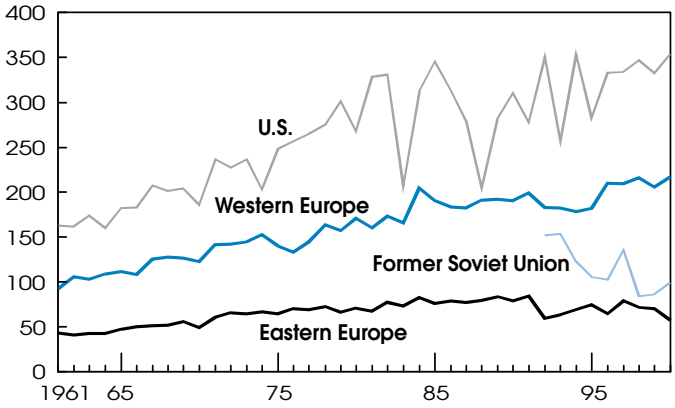
The FSU region of Europe is likely to be a significant source of volatility in future world production and trade. Russia and the Ukraine are the most important agricultural producers in the region.

The decade-long transition occurring in Russia and many of its close FSU neighbors (e.g., Belarus, Ukraine, and the Moldova Republic) is more wrenching than in Eastern Europe and has resulted in dramatically lower yields, lower input usage, smaller area harvested, and a severe decline in food consumption. The move from large state farms with centralized control to a more chaotic mixture of state farms and some private farms attempting to operate in a market environment has been difficult. Production and consumption declined largely because of the withdrawal of subsidies to state farms and to consumers. In addition, crop production is inefficient because of a lack of critical institutions to enforce the rule of law regarding land use and ownership.

Trends in European Agriculture Vary by Region

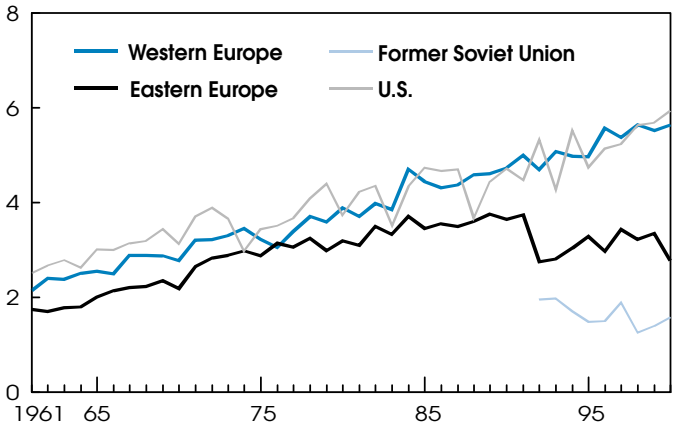
Cereal Production

Million metric tons



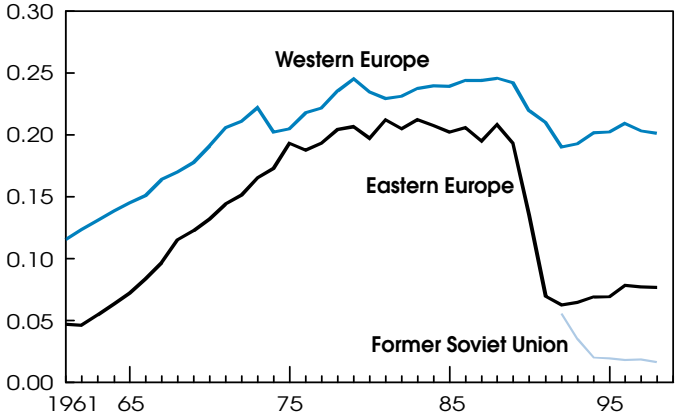
Cereal Yields

Metric tons/hectare



Total Fertilizer Use

Metric tons/hectare



Cereal crops include wheat, feedgrains, and rice. Fertilizer data not available for 1999. 2000 forecast.
Source: FAOSTAT Database.
Economic Research Service, USDA

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Reducing Costs of Producing in the FSU

Agricultural production costs in the FSU are relatively high. Crop production in the FSU would likely increase if production costs were lowered, making agricultural products more competitive with imports. Costs could be reduced by addressing farm-level reform and institutional reform.

The bulk of farm-level reform attempted so far in Russia consists of the privatization campaign of the early 1990's. The large former state and collective farms were officially reorganized, but they remained intact and essentially unreformed. Actual privately owned farming operations (as opposed to household plots associated with the large farms) accounted for only 6 percent of total sown area and 3 percent of crop production in 1997. While the legal status of the former state farms has changed, many of their economic incentives have survived. Insolvent farms cannot go bankrupt; when farms cannot repay government loans, the loans are either forgiven or rolled over indefinitely. With no significant market for agricultural land, there is no mechanism for transferring land to more skilled managers.

The goal of meaningful farm-level reform would be to create economic incentives to facilitate the movement of land, labor, and capital from farms with high costs to those with low costs. Bankrupting insolvent agricultural enterprises is one way to divorce resources from high-cost farms. Another way to redistribute land to low-cost producers is to develop a mortgage market. The most cost-efficient farmers, who stand to earn the most from agricultural land, would be those willing to bid the most for farmland. The current 10-year policy strategy of the Russian Ministry of Agriculture cites the necessity of bankrupting chronically insolvent farms and the development of a land market.

The second approach to lowering costs in FSU agriculture is to implement institutional reforms that would complement farm-level reform. In order to develop a mortgage market, for example, legislation has to be passed to permit it, and an institutional framework is needed to regulate and enforce mortgage contracts. The Russian Ministry of Agriculture policy strategy does not state specifically whether land will be used for collateral in mortgage transactions. Currently the Russian Federation prohibits the use of land for collateral. In Ukraine, a land reform bill passed in 1995, but the parliament imposed a 6-year moratorium on agricultural land transactions.

Development of a rural finance and banking system would also help lower costs. Such a system would allow profitable farms to expand their holdings by purchasing resources released by bankrupt farms, and to invest in new technology.

The countries of the FSU have not made much progress in farm-level and institutional reform, largely because it has not been attempted. The largest obstacle to farm-level reform is the political will for land reform. The conservative agricultural establishment in Russia and Ukraine has consistently opposed the private ownership of land and in general opposes making land a commercial commodity.

Price and trade liberalization began in Russia and Ukraine in 1992. From 1990 to 1998, crop production fell substantially—35 percent in Russia and 39 percent in Ukraine. The fall in output, especially grain, is due to the effects of reform on demand and supply of crops and livestock in the two countries.

Consumption and production of livestock products in Russia and Ukraine were heavily subsidized during the 1970's and 1980's. The removal of these subsidies after 1992 led to a substantial drop in livestock inventories and, consequently, the demand for feed grain. In addition, the free fall in consumer income following the reforms led to a drop in demand for relatively expensive meat products and a rise in demand for their cheaper substitutes, bread and potatoes. A modest increase in demand for food grain has been overwhelmed by the decline in demand for feed accompanying the collapse of the livestock sector.

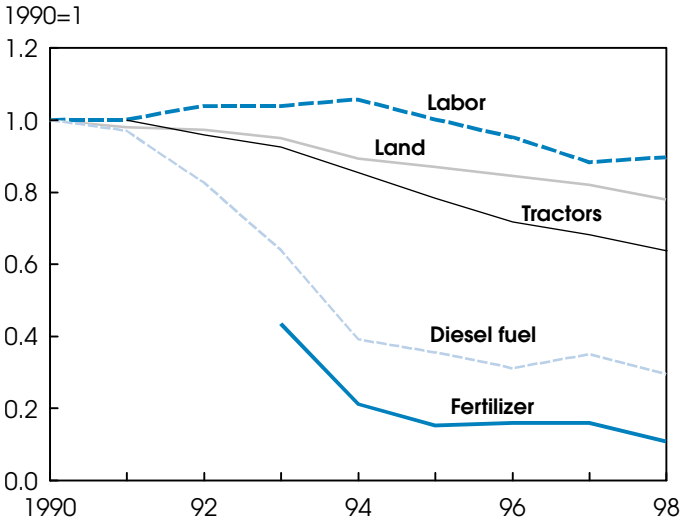
Before 1992, the supply of crops and livestock in the FSU was boosted artificially by three kinds of subsidies: 1) direct budget subsidies, 2) border price support, and 3) indirect input price subsidies. Direct budget subsidies are payments to farms out of the budget but have played a relatively small role in FSU agricultural support. Border price support (e.g., tariffs) kept domestic producer prices above world trade prices. Indirect input price subsidies were the most important in stimulating supply and kept the price of agricultural inputs low relative to agricultural outputs. The input price supports were not the result of financial subsidies from the government's budget. Rather, the planned economy structured the administrative price system so that farmers' revenue from output was higher than expenditures on inputs.

The end of subsidies led to a steep decrease in the price of outputs and an increase in the prices of tradable inputs (i.e., products that can be sold for foreign exchange) such as herbicides, fuel, and especially fertilizer. The result was a dramatic decline in the use of tradable inputs. From 1990 to 1997, average fertilizer use per hectare fell from 88 kilograms to 16 kilograms. Consequently, yields—which had been catching up with yields in the U.S. and Europe in the late 1980's—fell sharply in the 1990's. Wheat yields in 1997 in the FSU were the same as those that prevailed in 1975.

Removal of the three subsidies mentioned above led to a price system that reflects the technology of production and market preferences. Much of the fall in crop production is, therefore, a natural market response to unsubsidized prices.

Nevertheless, some increase in crop production in the FSU could occur in two possible ways: 1) governments may choose to

Farm Input Use Has Dropped in Russia



Fertilizer data not available for 1991-92.
Source: Goskomstat (Russian Statistical Agency).

Economic Research Service, USDA

implement supports to boost agricultural production, and 2) production may improve under institutional reforms (see sidebar).

It is unlikely that agricultural policy will change sufficiently in the near future to have a major impact on agricultural production. Russia's Ministry of Agriculture, for example, recently acknowledged that it lacks the financial resources to implement significant support policies for agriculture. While it is possible that the government may choose to increase agricultural production through subsidies, it could do so only for a limited time.

Even if the government fails to stimulate agricultural production through direct support, it is still possible that production will recover somewhat if reforms are successfully completed. However, even if reform is successful, production will not return immediately to pre-reform levels, since most of the drop in output is an irreversible response to the removal of Soviet-era subsidies.

Prospects for Agriculture

The tumultuous decade of the 1990's has continued to have a large impact on the agricultural sectors in Eastern Europe and the FSU. These countries continue to struggle with creating the necessary institutions and policies to develop economies that provide appropriate market signals between consumers and producers. To date, the agricultural sectors in the FSU have been set back by the chaotic conditions created by a lack of institutions to deal effectively with the new market conditions. It appears that the FSU will be a net importer for at least the next few years, and Eastern Europe could become a net exporter of grain within the next decade.

Western European agriculture continues to be dominated by the Common Agricultural Policy of the 15 member states of the European Union. Many of the nations of Eastern Europe have been adopting the mechanisms of the CAP and will likely attain higher levels of productivity, enhancing their likelihood of becoming net exporters of agricultural products. Western Europe should continue to be a major player in the export markets of most major commodities. Aging populations throughout Europe, and a low population growth rate due to low birth rates, have contributed to slow growth in domestic food demand that is likely to continue into the foreseeable future.

Growth patterns in crop yields and composition of agricultural production in these three regions are likely to change over the next decade because of 1) enlargement of the European Union to include most of Eastern Europe and 2) the direction of agricultural policy and agriculture in the FSU. In the aggregate, though, Europe will remain a net grain exporter to the world. **AO**

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- Policy changes in Japan
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